

Appl. No. 10/705,521

Amdt. dated October 1, 2004

Reply to Office Action of June 3, 2004

REMARKS

Reconsideration of the application is requested.

Applicants acknowledge the Examiner's confirmation of receipt of applicants' certified copy of the priority document for the German Patent Application 101 22 194.0, filed May 8, 2001, supporting the claim for priority under 35 U.S.C. § 119.

Claims 1-8 remain in the application. No claims have been amended.

In "Claim Rejections - 35 USC § 112", item 3 on page 2 of the above-identified Office Action, claims 3-7 have been rejected as being indefinite under 35 U.S.C. § 112, second paragraph.

More specifically, the Examiner states that in claims 3-7, the term "said capacitance" lacks antecedent basis. However, the Examiner's attention is directed to lines 5-6 of claim 1 which call for "a frequency-determining capacitance." This provides direct antecedent for "said capacitance" in claims 3-7.

The Examiner points to the term "said capacitor" which is part of the term "said capacitor elements" in claim 5. However, the antecedent for that term is directly found in claim 4 which calls for "a plurality of discrete capacitor elements."

It is accordingly believed to be clear that the term in

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question has a proper antecedent. The claims have therefore not been amended since they meet the requirements of 35 U.S.C. § 112, second paragraph.

In "Claim Rejections - 35 USC § 103", item 6 on pages 3-4 of the above-identified Office Action, claims 1-8 have been rejected as being obvious over U.S. Patent No. 4,074,209 to Lysobey in view of International Publication No. WO 89/06456 to Davis under 35 U.S.C. § 103(a).

As will be explained below, it is believed that the claims were patentable over the cited art in their original form and, therefore, the claims have not been amended to overcome the references.

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful. Claim 1 calls for, *inter alia*, a phase locked loop for open loop mode, comprising:

a voltage controlled oscillator having a first tuning input for a tuning voltage and a signal output for an output signal of tunable frequency;

said voltage controlled oscillator having a frequency-determining capacitance controlled using a second tuning input;

a frequency divider having an adjustable division ratio for the purpose of channel adjustment for the phase locked loop, having an input coupled to said signal

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output of said oscillator, having an output carrying a frequency-divided output signal and coupled to said first tuning input of said oscillator in a control loop, and having a control input for stipulating the division ratio; and

a frequency stipulation unit for programming the frequency of the output signal of tunable frequency connected, firstly, to said control input of said frequency divider for transmitting a frequency word and, secondly, to said second tuning input of said oscillator for transmitting the frequency word such that a change in the tuning voltage upon a change in the frequency word disappears or is as small as possible in order to avoid any frequency drift in an open loop mode of the phase locked loop.

Accordingly, the invention of the instant application, as claimed, calls for a phase locked loop having a voltage controlled oscillator (1) with a frequency determining capacitance. The capacitance is controlled by a second tuning input (12). A frequency divider (2) having an adjustable division ratio (N) for the purpose of channel adjustment for the phase locked loop has an input coupled to a signal output (13) of the oscillator (1). The frequency divider (2) also has a control input for stipulating the division ratio (N) of the frequency divider (2).

The phase locked loop also includes a frequency stipulation unit (8) for programming the frequency of the output signal. The frequency stipulation unit (8) is connected firstly to the control input of the frequency divider (2) for transmitting a frequency word. The frequency stipulation unit (8) is

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secondly connected to the second tuning input (12) of the oscillator (1) for transmitting the frequency word in such a way that a change in the tuning voltage (VTUNE) upon a change in the frequency word disappears or is as small as possible in order to avoid any frequency drift in an open loop mode of the phase locked loop.

In other words, the subject matter claimed in the instant application involves the memory effect of the loop filter capacitors in the phase locked loop being compensated through the use of a resonant frequency preselection. The second tuning input (12), to which the frequency word is transmitted, is used to compensate for any change in the tuning voltage (VTUNE) upon a change of the channel in the phase locked loop. This will allow the tuning voltage (VTUNE) to remain virtually constant upon a change in the frequency word. This principle and the advantages of the present invention are also described between the third paragraph on page 5 and page 7 of the Specification of the instant application.

The Lysobey reference discloses wide range frequency modulation of a phase locked loop oscillator. The phase locked loop oscillator itself has a narrow loop bandwidth. The reference deals with the problem of performing a direct frequency modulation while maintaining the bandwidth for low chase noise.

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The output of the oscillator is connected to a frequency divider 30, which is included in a control loop. The control loop is connected to a first frequency determining capacitance of varactors 36 and 37. The frequency divider 30 also has a control input for selecting a division ratio.

The signal for stipulating the division ratio of the frequency divider 30 is also fed to a D/A converter 33. The output of the D/A converter 33 is connected to a trimmer capacitor C1 between two cathodes of a pair of varactors 38 and 39. That pair of varactors 38 and 39 is part of the voltage controlled oscillator and is connected parallel to the varactors 37 and 36 of the tank circuit of the VCO.

A tuning input is provided for modulating the frequency of the output signal. The tuning input is connected and coupled to the anodes terminals of the varactor diodes 36 to 39 of the frequency determining tank circuit of the VCO.

As can be seen from Fig. 3 of Lysobey, the output of the D/A converter 33 is not connected to the tuning input of the voltage controlled oscillator but is used only to bias the cathodes of the varactor diodes 38 and 39. In the same way, the output of the frequency divider 30 is used for the varactors 35 and 36. On the other hand the tuning input of

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the local oscillator is not used to compensate for a change in the tuning voltage upon a change of the frequency word, but used as an input for a broad frequency modulation.

Davis does not disclose any additional information for a person skilled in the art. Even after studying Davis, a person skilled in the art would not be able to combine Davis with Lysobey in order to reach the subject matter of claim 1 of the instant application.

In addition to the arguments presented above, clearly the references do not show:

"a frequency divider having an output coupled to said first tuning input of said oscillator" and

"a frequency stipulation unit ... connected ... to said second tuning input of said oscillator for transmitting the frequency word such that a change in the tuning voltage upon a change in the frequency word disappears or is as small as possible"

as recited in claim 1 of the instant application.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claim 1. Claim 1 is, therefore, believed to be patentable over the art. The dependent claims are believed to be patentable as well because they all are ultimately dependent on claim 1.

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In view of the foregoing, reconsideration and allowance of claims 1-8 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, counsel would appreciate receiving a telephone call so that, if possible, patentable language can be worked out.

Petition for extension is herewith made. The extension fee for response within a period of one month pursuant to Section 1.136(a) in the amount of \$110.00 in accordance with Section 1.17 is enclosed herewith.

Please charge any other fees that might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner and Greenberg, P.A., No. 12-1099.

Respectfully submitted,



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LAG/bb

October 1, 2004

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